

Claims

1. A method for producing copolymeric polyacrylate pressure-sensitive adhesives, in which a monomer mixture comprising acrylic acid and/or methacrylic acid and/or derivatives thereof is subjected to a free-radical polymerization, characterized in that, based on the monomer mixture, 0.05% to 25% by weight of acrylated or methacrylated nitroxide derivatives of the general formula



is used, where $\text{R}_1 = \text{H}$ or CH_3 and R_3 is a nitroxide derivative,

or in that a polyacrylate is reacted with a nitroxide derivative to give a nitroxide-modified polyacrylate corresponding to one obtained in accordance with the first alternative.

2. The method of claim 1, characterized by free-radical polymerization of at least the following constituents:

(A) acrylic acid and/or methacrylic acid and/or derivatives thereof according to the formula



where $\text{R}_1 = \text{H}$ or CH_3 and $\text{R}_2 =$ an alkyl chain having 2-20 carbon atoms, in a fraction of 45% to 99.95% by weight,

(B) acrylated or methacrylated nitroxide derivatives of the general formula

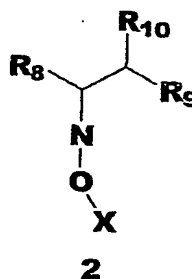
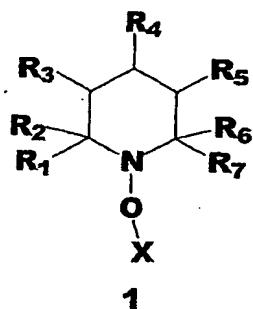


where $\text{R}_1 = \text{H}$ or CH_3 and R_3 is a nitroxide derivative, in a fraction of 0.05% to 25% by weight.

3. The method of claim 1 or 2, characterized in that the polymerization is additionally carried out with

(C) at least one vinyl compound having functional groups, or a mixture thereof, in a fraction of 0% to 30% by weight, based on the monomer mixture.

4. The method of any one of claims 1 to 3, characterized in that as nitroxide derivative a compound is used which may be represented by one of the following general formulae



R₁-R₉ = alkyl or aryl or further functional groups

5. The method of any one of claims 1 to 4, characterized in that the vinyl compound
5 is selected from the group consisting of vinyl acetate, acrylamides, and photoinitiators functionalized with double bond.
6. The method of any one of claims 1 to 5, characterized in that the polymerization
10 takes place in solution, preferably in organic solvents or water or a mixture of organic solvents and water, the solvent preferably comprising high-boiling aromatics, especially toluene or xylene.
7. The method of any one of claims 1 to 6, characterized in that in a further step at
15 least one further monomer is added to the nitroxide-modified polyacrylate and, after an increase in temperature to at least 100°C, a nitroxide-controlled free-radical polymerization, initiated by the cleavage of the nitroxide derivative and formation of free radicals along the polyacrylate backbone, is carried out to give a comb block polymer.
8. The method of claim 7, characterized in that the nitroxide-modified polyacrylate
20 prepared in solution is admixed with the further monomer and thereafter is subjected to a concentration step at elevated temperature, thereby initiating the free-radical polymerization with the further monomer to give the comb block polymer.
9. The method of claim 7, characterized in that, following concentration where
25 appropriate, the nitroxide-modified polyacrylate is admixed with the further monomer and subsequently processed further in a hotmelt process, in which the free-radical polymerization with the further monomer is initiated to give the comb block polymer.

10. The method of any one of claims 7 to 9, characterized in that the further monomer is styrene, a styrene derivative, an acrylate or a methacrylate.
- 5 11. The method of claim 10, characterized in that the molecular weight of the individual polystyrene blocks is adjusted to between 500 and 50 000 g/mol, preferably between 4000 and 30 000 g/mol.
- 10 12. The method of any one of claims 7 to 11, characterized in that the temperature of the polyacrylate composition for copolymerization with the further monomer is increased to 130°C.
13. A nitroxide-modified polyacrylate obtainable by a method of any one of claims 1 to 12.
- 15 14. The nitroxide-modified polyacrylate of claim 13, characterized by an average molecular weight of between 500 000 and 2 000 000 g/mol (M_w), preferably between 600 000 and 1 000 000 g/mol (M_w).
- 20 15. A comb block polymer having pressure-sensitive adhesion properties, obtainable by polymerizational attachment of blocks onto a nitroxide-modified polyacrylate of claim 13 or 14 by a method of any one of claims 7 to 12.
- 25 16. The use of the comb block polymer of claim 15 for producing pressure-sensitive adhesive articles.
17. The use of claim 16 for producing pressure-sensitive adhesive tapes or sheets by coating one or both sides of a backing with a pressure-sensitive adhesive which comprises or consists of the comb block polymer of claim 15.
- 30 18. The use of claim 16 or 17, wherein the comb block polymer, before or during processing to give the pressure-sensitive adhesive articles, has been blended with crosslinkers, resins, plasticizers, fillers or other additives or auxiliaries.